CRC Construction Innovation
BUILDING OUR FUTURE

Automated Scheduler

A prototype computer software tool that automatically prepares construction schedules together with a 4D simulation of the construction process from a 3D CAD building model.

CRCs bring together researchers from universities, CSIRO and other government laboratories, and private industry or public sector agencies, in long-term collaborative arrangements which support research and development and education activities to achieve real outcomes of national economic, environmental and social significance.

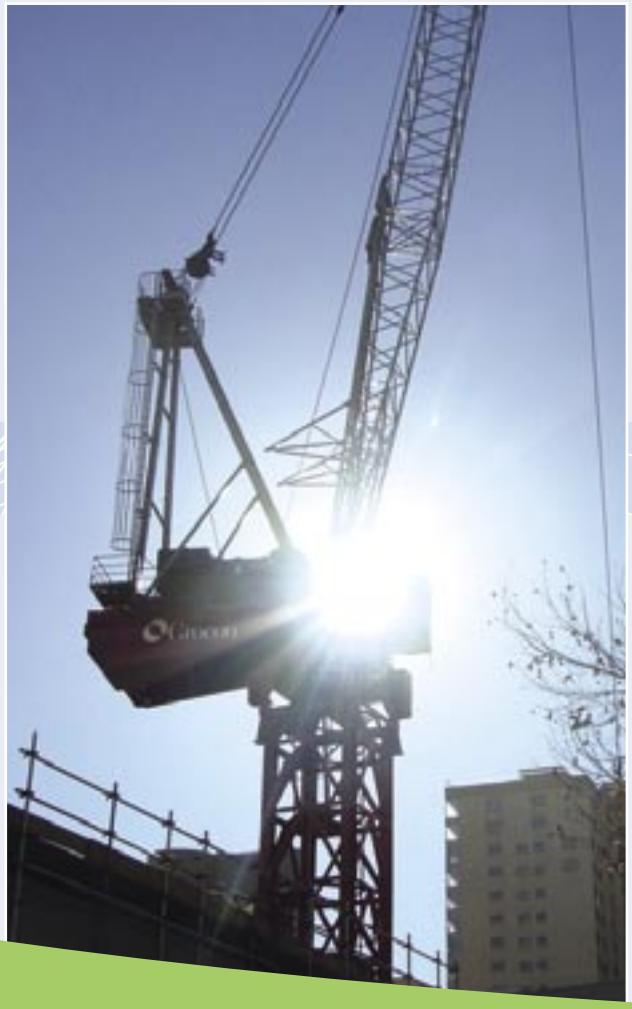
CRC AUSTRALIA

An industry need

Developing a construction plan is a critical task in the management of construction projects. The preparation of the required plans and schedules is more than a time-consuming process - it also involves significant costs; and sharing and exchange of information and ideas. A collaborative approach from the participants certainly assists the process.

In the early stages of a project several plans may be developed to assess alternatives in sequencing, timing and use of resources. During construction, the higher level plans need to be defined at greater levels of detail within the constraints imposed by the initial planning process and the evolution of the process itself.

The preparation of these plans using Gantt charts takes a lot of time – and the process overall is often error prone because a number of factors need to be considered simultaneously. Tools such as *Automated Scheduler* can improve both the efficiency of specific projects and of the construction industry overall.



What is Automated Scheduler?

Automated Scheduler is a prototype software tool that automatically prepares a construction schedule together with a 4D simulation of the construction process from a 3D CAD building model.

Information contained within a 3D CAD Building Information Model is exported as Industry Foundation Classes (IFC[1]) data. This data is used to populate a database. Automated Scheduler uses this data and a set of knowledge rules determining which elements are constructed together, the supporting relations and precedence knowledge, to generate a simple building construction plan. Recipes including construction time and resources are used in the generation of the schedule.

Automated Scheduler then prepares the files necessary to show the construction process using Microsoft Project™, Common Point (**www.commonpointinc.com**) and the Viewer.

Automated Scheduler advances beyond existing tools by providing an automated scheduling process, an object-based rule system, and a central database for data sharing and communication with other applications.

Automated Scheduler currently covers the following structural elements: beams, columns, slabs, walls and footings.

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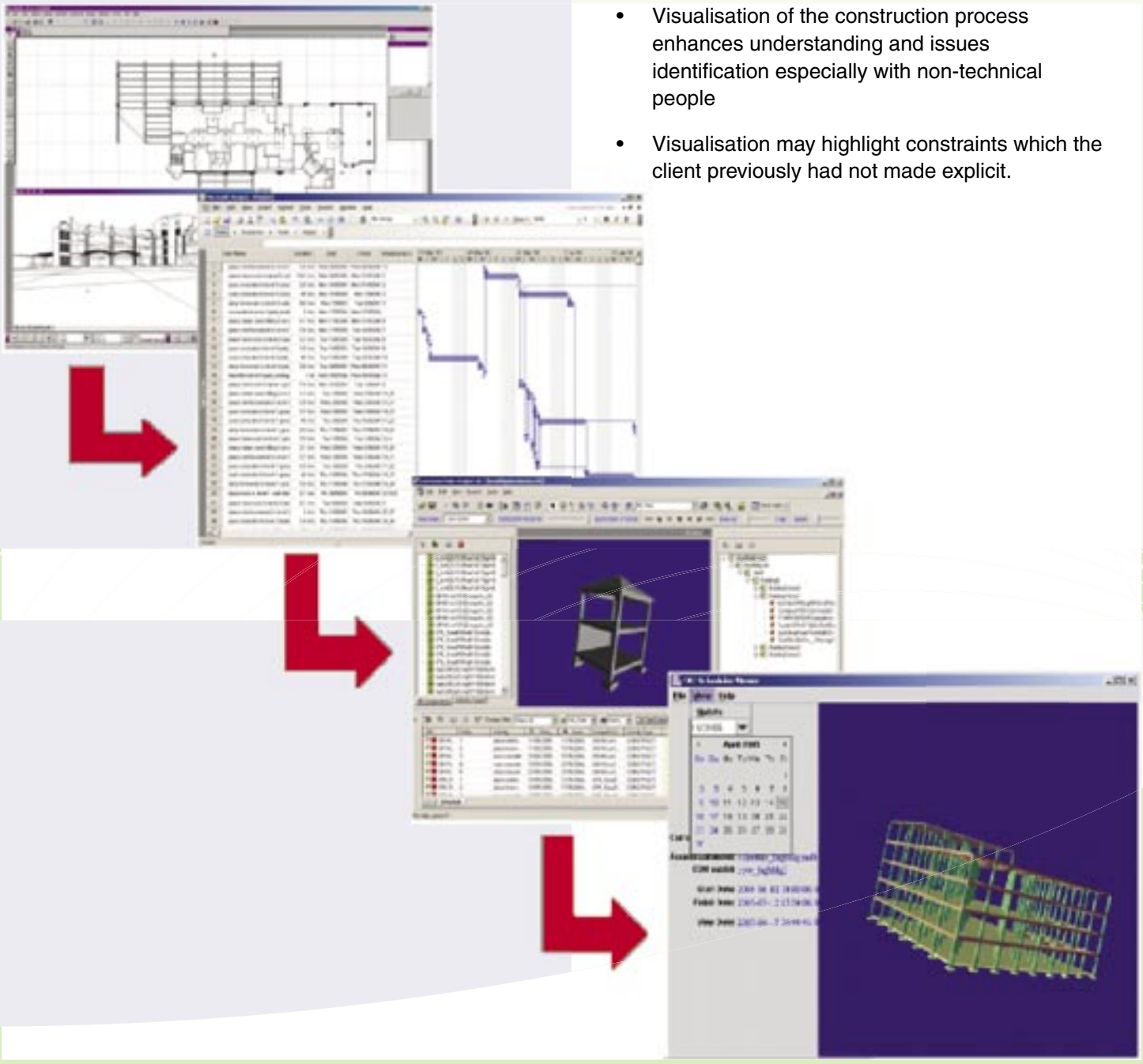
[1] IFCs have been developed by the International Alliance for Interoperability (IAI), a non-profit global alliance of building, construction and software industries with over 650 member organisations in 20 countries. Interoperability enables participants to share common project information across disciplines and technical applications (www.iaiinternational.org).

Likely users of Automated Scheduler

- Building contractors/subcontractors
- Architects/Designers
- Consultants
- Construction principals
- Academics/teaching institutions

Benefits of Using Automated Scheduler

- Cost and time savings can be achieved in all planning/scheduling stages
- The chance of errors is reduced
- Performance of less-experienced planners is enhanced
- Teamwork, communication and collaboration among all stakeholders is improved
- Management processes can be better coordinated
- Data exchange and feedback becomes more efficient
- Visualisation of the construction process enhances understanding and issues identification especially with non-technical people
- Visualisation may highlight constraints which the client previously had not made explicit.



CRC for *Construction Innovation*

Automated Scheduler has been developed by the Cooperative Research Centre (CRC) for *Construction Innovation*. *Construction Innovation* is a national research, development and implementation centre focused on the needs of the property, design, construction and facility management sectors. It takes ideas and turns them into collaborative research to produce industry-relevant results for our partners and the whole industry.

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Partners in progress

Automated Scheduler is a collaborative product developed by the CRC for *Construction Innovation* with project input from by CSIRO, University of Newcastle, Woods Bagot and John Holland

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The University of Newcastle Australia

Images courtesy of *Construction Innovation* participants

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